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NEW SCIENTIFIC STANDARDS FOR PROTECTION OF WORKERS

ALICE HAMILTON
Staff of U. S. Bureau of Labor Statistics

I SHALL have to begin by saying that I cannot very well discuss New Scientific Standards for Industry, because there are none. We have a mass of information about certain dangers in industry. We know a great deal about the dangers of dust, and of the poisons, and the dangers of overstrain, sudden and long continued overstrain, and such things as heat and humidity; but we do not know how to gauge them, we do not know the point at which these features of industry begin to be really dangerous.

Let me tell you very briefly what we do know about industrial diseases. Back in the first century after Christ, Pliny the elder spoke of the diseases of slaves, lead poisoning and mercurial poisoning, and the consumption of knife grinders and potters. We have all of those still with us. Lead is still our most important industrial poison, mercury is still in use though it has been surpassed by others, and we have added enormously to the list of poisons. We still have consumption from knife-grinding, and from the flint dust in the potteries, and of course we have an enormous number of other dusts in industry today.

Of the dusty trades there are certain that are notoriously dangerous, which we expect to have accompanied by a high rate of respiratory diseases. Others we are not so sure of—the softer dusts, for instance. Perhaps you have heard of the bitter controversy that went on in California over Portland cement. We are not positive about the harmfulness of Portland cement dust, nor do we know much about a soft dust like soapstone, which is largely used in industry. For a long time it was a mystery to us why the coal miner, working in so dusty an atmosphere, escaped consumption. Of course we know that a great many of them do not live long enough, anyway, to get consumption; they die of accident, but even those who survive do not seem to get consumption when one would expect them to. But gradually we have come to see that these softer dusts act upon the lungs in a way different from the sharp and hard dusts. They act by setting up a slow formation of connective tissue which gradually closes up the drainage system of the lungs, and the people who breathe in soft dust die of pneumonia instead of consumption. When they get pneumonia they succumb to the disease because of this change in the lungs. They cannot throw off a pneumonia as a normal person can, because their sluice ducts have been closed up, the connective tissue has closed the drainage system. It is as if the sewerage system of a city were clogged, and then there was a sudden thaw.

We have found of late that it is not the large and coarse dusts that do the harm, it is the very fine dusts that can penetrate to the lungs. The coarse dusts are caught in the mucous membranes and gotten rid of in that way, but the fine dust gets to the lungs, so that there may be more consumption in a textile mill where you can just see the dust, and not enough to impress you much, than in some stone-cutting sheds where the air is thick with coarse dust because in the one case the dust gets into the lungs, and in the other case most of it does not get in. These things we do know about the dusty trades, but we do not know when a dusty trade begins to be dangerous. We have begun under the leadership of Professor C. E. A. Winslow of Yale, to be able to collect the dust in the air, and to estimate the number of particles of fine dust, dangerous dust, in the air per cubic meter, and we are going to establish gradually a standard of dust, although it will be a long time before we know where the danger point begins. Perhaps we shall some day reach the place where we can say, "you may have so many particles of dust per cubic meter" just as the Health Department says "you may have so many thousands of bacteria per cubic millimeter of milk." It will be a great help when we get to that point, but we are quite far from establishing any such standards for the dusty trades as yet. About the poisons, too, we know a great deal, but there is much more that we do not know. We have known for many years about some metallic poisons, lead and mercury and arsenic, and we are beginning to know about manganese, because now we are getting the manganese from our own ores. But the war has brought a great many new poisons to us, not only the poisons used in making explosives, but many others. Formerly all our coal-tar products came from Germany. Naturally they were expensive and we did not use them much. Now we are making coal-tar distillates ourselves, and we are using quantities of benzol, and nitrobenzol and aniline, and those are poisons to the nervous system and the blood. The old and familiar poison carbon monoxide gas has become much more dangerous of late. We have had that gas in industry for many years, but now with the increased use of producer gas for heat and power and the increased use of motor engines, carbon monoxide poisoning is increasing.

We know pretty well what happens when a person is overcome by one of these poisons, but those are the acute cases, the men exposed to large doses; and they are the exceptions, not the rule. Industrial poisoning is rarely acute, it is typically chronic. The typical industrial case is one that comes from many tiny doses repeated month after month and year after year, and about these we know very much less. Probably for every man who is gassed with carbon monoxide in the great steel-rolling mills, there are hundreds of tailors and bakers and laundry workers and linotypers and electrotypers who are slowly poisoned by the minute quantities of carbon monoxide in the air that comes from naked gas jets; and for every man who is gassed by going into a benzol still to repair it, there are probably hundreds who lose their health gradually by working with rubber cement, and by working in varnishing establishments, getting a little benzol every day. We hope to be able to find out through studies that we are making on the changes in the blood just where the danger point in chronic poisoning begins, but we are a long way from that as yet.

We know a great deal about fatigue, we know that it causes nutritional and nervous disturbances that are serious. We know the work of Professot F. C. Lee and Josephine Goldmark. Throughout the war they have been working very hard to devise some method for determining the point at which fatigue begins, and at which exhaustion begins, but they have not succeeded yet. We have no standard for the weight that a woman ought to be able to lift, and I do not know how we shall ever arrive at such a standard.

A great deal of work has been done on the question of heat and humidity by Professor Winslow. But all his work was done on men, as he himself told me. Women's standards of heat and cold are different from men's. Women seem to stand the cold better. I find as I go around in industrial establishments, that if there is a large room with men and women working together, some of the windows will be up, while if there are only men in the room the windows will all be down.

We do not know yet whether women ought to be protected more from poisons than men. We know they ought to be protected more from lead poisoning than men, because lead is a worse poison for women than it is for men. I do not mean that the symptoms are necessarily more serious in women than in men, though they are likely to be different. Lead convulsions are more common in women than in men, as is lead blindness, while lead colic and lead palsy are common in men. But the serious thing about lead poisoning in a woman is that it passes on to her children, and if she works in lead prior to marriage she is not likely to have healthy children, indeed she is not likely to have living children, and if she continues the first year after marriage, the results are much worse than if she had stopped her lead work at marriage. That means that lead is a race poison, and that women must be protected much more in lead work than men are.

We do not know about other poisons in this respect. Reasoning from analogy we should suppose that some others would have the same effect. Dr. Stockhard of Cornell, has found that alcohol is a race poison, that alcoholism in the mother is much more apt to have an effect on the offspring than alcoholism in the father. If that is true it seems to me perfectly reasonable that it would be true also of other poisons that affect the nerve centers, such as nitro-benzol and trinitrotoluol, and others to which women are being exposed in munition plants, some of which they may now begin to work with in the dye industry.

Of course all this means that we have no absolute standards as yet which we can lay down for industry, but it does not mean that because of our lack of complete knowledge we cannot insist upon such things as shorter hours and better working conditions for women in industry.

Sometimes I think that we are rather obsessed with the necessity for statistics. I would not for anything decry the importance of research work, but I do think that sometimes it leads us to ignore another kind of knowledge which comes from long experience, even if we have not tabulated that experience and cannot tabulate it. Of course there are people who would not venture to tell you which way the wind was blowing by looking at the bulrushes, they would first have to count the bulrushes and make sure that the majority were pointing in one direction. I remember a very celebrated Boston physician who told me that if a statistical study confirmed his idea, an idea that he had already had, he must distrust it; but if the statistical study disagreed with his idea, then he looked upon it with much more respect, because then it could not have been affected by his unconscious bias. I think this makes too important one form of research and gives too little importance to the other form. After living twenty-one years in an Italian and Jewish neighborhood I am convinced that there is more rickets amongst Italian children than among Jewish children. If a student came to me with the results of his research and showed me that it was the other way around, I would not believe it. I should go on thinking that there is more rickets among the Italians than among the Jews, and that he had happened upon an unusual lot of people of those nationalities.

All this means simply that there are certain things about which we can say that, while they are not proved scientifically, they stand to reason. It stands to reason that an eight-hour work day is long enough for any woman, and too long for some women. Take the eight hours from eight a. m. to twelve noon, and from half-past twelve to half past four, and add half an hour at each end for coming and going, so that a woman leaves home at 7.30 in the morning and gets home at 5.00 in the evening; I don't think we need elaborate physiological tests to show us that that woman is quite tired enough, quite as tired as she should be, to say nothing about her having time for outdoor exercise. I do not think we should be obliged to collect fumes and test them on animals, or to collect dust and look at it under the microscope in order to prove the danger of fumes and dust. I think we ought to be able to say that working people have a right to work in a clean and fairly comfortable and decent place. Of course I spend all my working time doing just that sort of thing, trying to get a series of facts which will convince skeptical employers and legislators that certain things in industry are real dangers to health, perhaps to life. But I look to the day when my job will be no longer needed, when the working people will say, " It is not necessary for us to show that this dust is going to eat out our lungs, it is not necessary to show that these poisons are getting into our blood, or that a loud, continuous jarring noise will frazzle our nerves; it is enough for us to say that dirt is disagreeable, that fumes are obnoxious, that noise is wearying, and that these things are not necessary, and if the engineering experts will put their minds to it they can be done away with, and we intend that they shall be done away with." Perhaps that state of things is a long way off. I think I should have said so a year ago, but very strange things have happened in the last two months, and we do not know what the next twelve months will bring forth.